

Book Reviews/Comptes rendus

BENOIT GODIN, *Measurement and Statistics on Science and Technology: 1920 to the Present* London: Routledge, 2005, xx, 355p + index.

Statistics in the social sciences are indispensable tools of inquiry. Researchers go to great length to produce, assemble, discuss and display in an easy to understand format social and economic statistics. But scholarly works on how statistics are produced are scarce. In the history of statistics, science and technology statistics came late: not before the last century, whereas social statistics have been collected since the 18th Century.

Godin does a great job in situating the production of science and technology statistics in history. As early as the 1930s, there were pioneers such as Bernal, Merton, and De Solla Price, whose goals were essentially scientific and intellectual. There were others, like the economist Schmookler, who investigated the inventive activity in industry and the economy as measured by patents. But there were also other people, for instance Vannevar Bush and later Christopher Freeman, who had science and technology policy in mind. Individuals were often inventors of statistics, but institutions as well. Godin focuses his inquiry on three main institutions: the American National Science Foundation (NSF), the Organization for Economic Co-operation and Development (OECD) and UNESCO. These institutions were created after the Second World War. The war period had tasted science for military purposes. A Cold War was taking shape and there were indications that the Soviet Bloc was, by the end of the 1950s, on a fast track of investing a great deal in science and technology and competing with the West in some technological achievements. Godin seems to me to downplay, against authors like Fuller, the Cold War context in favour of the international economic context. Economists were leading actors in the OECD organization, but at the NSF and UNESCO, scientists and researchers had more to say and a greater influence on the production of statistics. National statisticians were also, as a group, important in the decision-making of what to measure and how to measure it. Godin points out that statisticians had relied on surveys, especially with respect to industry, and, despite their limitations, surveys were selected as a well-tested means to assemble statistics on science and technology.

One of the great converging numerical tools, supported by statisticians and economists alike, was the Gross Domestic Expenditure on Research and Development (GDERD), which as a percentage of GDP is employed, still today, to compare industrialized countries among themselves and, when

data are available, among a wider range of nations. Godin shows how the OECD tried and partly succeeded through two famous manuals and their revisions, the Frascati manual and later the Oslo manual on innovation statistics, to harmonize the production of S&T statistics over its member states, but there were also large differences in application. Every statistical office had its own culture of measuring. Science and technology statistics were not always top priority, though in particular government departments they were taken very seriously.

In fifteen chapters, Godin navigates through a complex historical sociology of science and technology statistics. The research work is impressive: he has gone through all relevant documents and interviewed key actors. He has built a story, in fact many stories, and a technical account – to use Tilly's terms for giving reasons – and interpreted sociologically what's behind the documents, using a broad constructivist perspective on the social production and appropriation of science and technology statistics. Statistics is a two-way process: it helps to assimilate the world around us, either social or natural, as well as it accommodates the world to our own categories, if I may use Piaget's concepts. In the process, statistics producers draw boundaries by including some aspects of reality while excluding others. For instance, social sciences were excluded up to the 1970s from science and technology statistics; related scientific activities, such as communication activities, were poorly measured, except in some attempts at UNESCO. Social actors tend to use these statistics for their own reasons and according to their own interests. S&T statistics may serve to define new areas for public action, but they may also be used to justify decisions already made. Godin discusses the brain drain issue and the use of statistics to document to what extent it was a major problem for some countries. Numbers and methodologies that construct them helped to dissipate false impressions and limit the extent of the brain drain angst: it was mostly an elite transfer and the drain is, in Europe, replenished by attraction from developing countries. The same can be said about the debate over the technological gap between Western Europe and the United States in the 1960s. Statistics helped to define the problem more precisely though they proved at the same time that they could not always provide final answers. Statistics more or less successfully abstract some dimensions from a complex reality. This abstraction is socially constructed, limited, and can partly be otherwise. In order to exist at all, statistics must reduce and be selective.

Science and technology statistics serve four purposes: theoretical, practical, symbolic and political (297). Symbolic and political uses, such as lobbying for funds and justifying decisions, have, according to Godin, been dominant; theoretical use is mostly reserved to researchers though they have more heavily relied on bibliometrics data. As for practical purposes, S&T statistics were considered only a rough set of data in policy-making.

Godin has mastered a diverse range of science and technology studies to write this book. Concepts such as social construction, controversy, boundary work, discursive practices, and so forth bear heavily on the

whole argument. I do think he could have fruitfully applied the idea of epistemic communities – in the interactionist idiom, epistemic social worlds – to describe the interactions between individual actors and organizations in the shaping of science and technology statistics. I also wonder whether the new institutionalism, as developed by Driori and her co-authors in *Science and the Modern World Polity*, could not have provided him with a complementary theoretical model.

For those who are interested in social statistics and their history, those who use science and technology statistics in research or teaching, and those who wonder why some statistics and indicators are widely cited, used and even abused, *Measurement and Statistics on Science and Technology* will be rewarding, even if occasionally the main argument is buried in the dissection of a mass of technical reports.

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